

**APPLICATION  
FOR  
UNITED STATES LETTERS PATENT**

**TITLE: PORTABLE READER**

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## Portable reader

### Field of the invention

The invention concerns a portable reader, in particular a portable reader  
5 arranged to read cards. The card can be, for example, a Subscriber Identity  
Module (SIM) card or an ISO card the format of which respect that specified in  
the ISO 7816 standard. More generally the card can be any portable object  
provided with an integrated circuit.

### 10 Background of the invention

EP1181663 A1 discloses a portable reader. The reader comprises a part for electric  
connection to the port of a computer, whereby said part exhibits four conduction  
lines in addition to a part for the insertion of a module which is removable and  
which can store confidential information, comprising the body of a plastic  
15 module which is substantially parallelepiped and rectangular whereby the  
dimensions thereof are 25 mm long, 15 mm wide and 0.76 mm thick, further  
comprising an integrated circuit chip provided with contact pads which are  
electrically connected to contact pads which are flush with one of the surfaces of  
said module, whereby the insertion part comprises a connector which has pins  
20 which are electrically connected to the electric connection lines of the reader and,  
when the module is inserted into said reader, to the contact pads of said module.  
The portable reader is specifically designed for readers, which are to be  
connected electrically to a USB port in a computer.

### 25 Summary of the invention

An object of the invention is to propose another solution.

According to one aspect of the invention a portable reader arranged to read a  
card, the card being provided with a set of contact areas, the reader being

provided with a connector, the connector being provided with a set of contact pads, wherein the portable reader comprises a first and a second holding element arranged to hold the card so that at least one contact pad of the set of contact pads can be connected to at least one contact area of the set of contact areas, and  
5 wherein at least one holding element is movable.

With the portable reader of the prior art, when the contact areas of the card are connected to the contact pads of the connector, the card is maintained by means of the insertion part. With the invention, when the contact areas of the card to be read are positioned on the connector, the card is maintained using the first and  
10 second holding elements.

#### **Brief Description of the Drawings**

Figure 1 is an exploded view of a portable reader;

Figure 2 illustrates the various elements of the portable reader;

15 Figure 3 illustrates a portable reader in two different embodiments;

Figure 4 illustrates a portable reader in two different embodiments;

Figure 5 illustrates a portable reader in two different embodiments.

#### **Detailed description**

20 Figure 1 shows an exploded view of a portable reader arranged to read cards, in particular smart cards.

Smart cards are standardized articles described in particular in ISO standard 7816. Smart cards are generally provided with an integrated circuit. The integrated circuit may comprise various functional elements, such as in  
25 particular a central processor unit (CPU) and volatile memory (RAM), non-volatile memory (ROM) and electrically erasable and programmable non-volatile memory (EEPROM). The central unit (CPU) manages data and addresses in the various memories by means of a bus. In general, data and addresses are respectively encoded on 8 bits and on 16 bits. The integrated circuits are

provided with six contact pads. These pads are identified by the initials VCC, GND, VPP, RST, CLK, and I/O. They serve respectively to supply the integrated circuit with electricity, to ground it, to supply it with a programming voltage, to reset it, to input a clock signal, and to perform data input and output. These  
5 pads are electrically connected to contact areas that are flush with the surface of the card. The VCC pad is connected to an area C1, the GND pad to an area C5, the VPP pad to an area C6, the RST pad to an area C2, the CLK pad to an area C3, and the I/O pad to an area C7. Part 2 of above-specified ISO standard 7816 relates to the number, size, and positioning of the electric contact areas on the  
10 card. Thus, as defined in that standard, in addition to the areas C1, C5, C6, C2, C3, and C7, the card also has two areas C4 and C8 that are reserved for future use.

The card reader comprises a base element (BASE) on which is fixed a pcb element (PCB). A first holding element (HE1) and a second holding element  
15 (HE2) are fixed to the pcb element (PCB). A top element (TOP) covers the pcb element (PCB).

The base element (BASE) and the top element (TOP) are made, for example, in a plastic material. The pcb element (PCB) comprises a support layer onto which is fixed a connector (CON) provided with 8 contact pads. The pcb element (PCB)  
20 further comprises a Universal Serial Bus (USB) plug that can be inserted in a USB port of a computer. The USB plug is provided with four conducting lines VCC, GND, D+, D-. These four conducting lines are electrically connected to the connector.

The first holding element (HE1) and the second holding element (HE2) are  
25 arranged to pivot using, for example, a pivot element (PIV). The first and second holding elements are provided with a first and a second card-receiving element (CARE1, CARE2). The first and second card-receiving elements are arranged in such a manner that when a card is inserted in the reader, the contact areas of the cards are connected to those of the connector and that the conducting lines VCC,

GND, D+, D- are respectively electrically connected to the contact areas C1, C2, C4 et C8 of the card.

Advantageously, as illustrated in figure 2, the first and second card-receiving elements (CARE1, CARE2) are arranged to receive cards having various formats, for example, both a SIM card and an ISO card. The first and second card-receiving elements (CARE1, CARE2) can be manufactured using, for example, molding techniques.

Figure 3 illustrates a first holding element in a closed position and a second holding element in an open position. The first and second holding elements can be provided with clipping elements (CLIP) so that they can be clipped to each other when they both are in a closed position.

The above-mentioned description illustrates a portable reader arranged to read a card. The card is provided with a set of contact areas. The reader is provided with a connector. The connector is provided with a set of contact pads. The portable reader comprises a first and a second holding element arranged to hold the card so that at least one contact pad of the set of contact pads can be connected to at least one contact area of the set of contact areas. At least one holding element is movable.

According to another aspect of the invention, the first and the second holding element (HE1, HE2) are respectively provided with a first and a second card-receiving elements (CARE1, CARE2).

According to another aspect of the invention, the first and the second card-receiving elements (CARE1, CARE2) are arranged to receive cards having various format.

According to another aspect of the invention, the first and the second card-receiving elements (HE1, HE2) are arranged to receive both a SIM card and an ISO card.

According to another aspect of the invention, the first and the second holding elements (HE1, HE2) are arranged to pivot.

According to another aspect of the invention, the portable reader further comprises a USB connector (USB CON).

- 5 According to another aspect of the invention, the USB connector is arranged to pivot. Thus, when connecting the portable reader to a USB computer port, the portable reader can be placed either in a substantially vertical position, or in a substantially horizontal position.

- 10 In the above-mentioned description, for example, as illustrated in figure 3, the pivot element (PIV) is placed near the USB connector. Alternatively, as shown in figure 4, the pivot element (PIV) can be placed at the other extremity of the pcb support.

- In the above-mentioned description, the first and second holding elements (HE1, HE2) were fixed to one pivot element (PIV). Alternatively, as illustrated in figure 5, each holding element can be fixed to a separate pivot (PIV1, PIV2).

In the above-mentioned description, a USB connector is used. More generally any other type of connector could be used like, for example, a PCMCIA or serial port. Having a USB connector is not essential to the invention.

- 20 In the above-mentioned description, two holding elements are used, but there can be three or more.